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CLAIMS

[Claim(s)]

[Claim 1] The supply roll for being a foil feeder for supplying a foil ingredient, and supplying a foil ingredient by a certain supply ability, in order to manufacture a foil bag by which motorised is carried out, A drawer means for a certain drawer ability to draw out a foil ingredient, It changes. the consumption sensor formed between said supply rolls and said drawer means for controlling actuation of said supply roll according to the consumption of a foil ingredient -- since -- said consumption sensor At least one fixed turn roller and at least one sensor roller supported and arranged so that it may pull out with the supply ability of a foil ingredient and the distance from said at least one turn roller may change according to a difference with ability, Change of said at least one sensor roller of the distance from said at least one turn roller is sensed. When the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, the rate of the driving gear of said supply roll is enlarged. the sensor means which makes the rate of said driving gear small when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance -- since -- the foil feeder characterized by what is changed.

{Claim 2] Said sensor means is a foil feeder according to claim 1 characterized by carrying out switch-off of said driving gear of said supply roll when the distance from said at least one turn roller of said at least one sensor roller exceeds said 2nd predetermined distance.

[Claim 3] It is the foil feeder according to claim 1 or 2 characterized by moving in accordance with said guide means while, as for said at least one sensor roller, the distance from said at least one turn roller changes by establishing a guide means.

[Claim 4] Said guide means is a foil feeder according to claim 3 characterized by being prepared in an abbreviation perpendicular.

[Claim 5] The foil feeder according to claim 1 to 4 characterized by adding weight to said at least one sensor roller.

[Claim 6] It is the foil feeder according to claim 1 to 5 characterized by only for one having more said turn rollers than the number of said sensor rollers, and hanging said foil ingredient on said turn roller and said sensor roller by turns.

[Claim 7] The foil feeder according to claim 6 characterized by forming at least two sensor rollers connected mutually.

[Claim 8] Said sensor means is a foil feeder according to claim 1 to 7 characterized by having the 1st sensor which outputs the signal for accelerating said driving gear when the distance from said at least one turn roller of said at least one sensor roller is smaller than said 1st predetermined distance.

[Claim 9] Said sensor means is a foil feeder according to claim 1 to 8 characterized by having the 2nd sensor which outputs the signal for decelerating said driving gear when the distance from said at least one turn roller of said at least one sensor roller exceeds said 2nd predetermined distance.

[Claim 10] The foil feeder according to claim 1 to 9 characterized by having the 1st insurance sensor which emits an error signal when the distance from said at least one turn roller of said at least one sensor roller is smaller than the minimum permissible distance.

[Claim 11] The foil feeder according to claim 1 to 10 characterized by having the 2nd insurance sensor which emits an error signal when the distance from said at least one turn roller of said at least one sensor roller is larger than maximum-permissible distance.

[Claim 12] Said insurance sensor is a foil feeder according to claim 10 or 11 characterized by consisting of a proximity switch.

[Claim 13] Said insurance sensor is a foil feeder according to claim 10 or 11 characterized by consisting of a photo-sensor component.

[Claim 14] It is the foil feeder according to claim 1 to 13 characterized by at least one side consisting of a proximity switch among said 1st and 2nd sensors.

[Claim 15] It is the foil feeder according to claim 1 to 14 characterized by at least one side consisting of a photo-sensor component among said 1st and 2nd sensors.

[Claim 16] Said photo-sensor component is a foil feeder according to claim 13 or 15 characterized by consisting of the optical barrier.

[Claim 17] Said error signal is a foil feeder according to claim 10 or 11 characterized by being used in order to carry out switch-off of said drawer means and the actuation section for the further processing of the supplied foil at least.

[Claim 18] Said drawer means is a foil feeder according to claim 1 to 17 characterized by driving intermittently.

[Claim 19] The foil feeder according to claim 1 to 18 characterized by forming at least two the supply rolls and consumption sensors by which motorised is carried out so that at least two foil webs can be supplied.

[Claim 20] Said motor of said supply roll is a foil feeder according to claim 19 characterized by driving with the common control unit which receives said signal from said sensor means of said corresponding consumption sensor.

[Claim 21] In the foil ingredient supply approach in manufacture of a foil bag etc. a foil ingredient It is supplied from the supply roll by which motorised is carried out, then is guided by at least one sensor roller whose distance from at least one fixed turn roller and said at least one turn roller is adjustable. Finally it is drawn out by the drawer means. When the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, The foil supply approach that the rate of said driving gear is characterized by what is made small when the rate of the driving gear of said supply roll is enlarged and the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance.

[Claim 22] The foil supply approach according to claim 21 characterized by carrying out switch-off of said driving gear of said supply roll when the distance from said at least one turn roller of said at least one sensor roller exceeds said 2nd predetermined distance.

[Claim 23] The foil supply approach according to claim 21 or 22 characterized by carrying out switch-off of said drawer means and the actuation section for the further processing of the supplied foil at least when the distance from said at least one turn roller of said at least one sensor roller is smaller than the minimum permissible distance.

[Claim 24] The foil supply approach according to claim 21 to 23 characterized by carrying out switch-off of said driving gear of said supply roll, said drawer means, the actuation section for the further processing of said foil, and the ** at least when the distance from said at least one turn roller of said at least one sensor roller exceeds maximum-permissible distance.

[Claim 25] Said foil is the foil supply approach according to claim 21 to 24 characterized by being intermittently pulled out by said drawer means.

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TECHNICAL FIELD

[Field of the Invention] A foil ingredient is supplied by the supply roll, and this invention is drawn out by the drawer means, for example, relates to the feeder of a foil ingredient for manufacturing a foil bag, and its approach.

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PRIOR ART

[Description of the Prior Art] In the process which pulls out since a foil ingredient is supplied as one supply roll and processed further, and is pulled out by the means, although a drawer means pulls out a foil ingredient at the rate of predetermined according to the working speed of the following processing station, tension must be given to the foil ingredient of the preceding paragraph of a drawer means. A supply roll rotates with the foil which is supported free [rotation] and pulled out.

[0003] Such a foil supply means is required in order to manufacture for example, a foil bag. A foil bag consists of the side-face foil of two rectangles mutually pasted up in the side edge section in the condition that the bag was filled. In order to prepare the space for packing in a foil bag, the base foil, i.e., the erection foil, pastes up alternatively among the four side edge sections, and it is bent. Packing is a drink etc.

[0004] With the conventional supply means, tension is given to the foil of the preceding paragraph of a drawer means by the so-called tensor means. The foil is guided with two or more fixed rollers and movable rollers which were arranged by turns. A movable roller is energized by the spring force it is so large that the distance of a movable roller and a fixed turn roller becomes small weak. Thereby, tension is always given to the foil.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since the sensor roller is carried on each foil with additional weight only with the appropriate self-weight according to the foil feeder and approach concerning this invention as explained above, the force concerning the foil is fixed and becomes fixed [the tension of the foil of the preceding paragraph of a drawer means]. Thereby, a foil ingredient can be supplied with a sufficient precision and the very high working speed which serves as a criterion with the present foil processing line can be maintained.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] With the above conventional supply means, since the diameter of a supply roll becomes small as a foil ingredient is rewound, the drawer force required in order to pull out the foil ingredient of a constant rate from a supply roll is not fixed, and the torque which should be given also changes along with it. Since the spring force of acting on a movable roller is proportional to expanding of the longitudinal direction of a spring and the force which a tensor means does to a foil ingredient will also change on the other hand if the distance of a movable roller and a fixed turn roller changes, the tension of the foil is not fixed.

[0006] However, for manufacture of a foil bag, it is dramatically important for high degree of accuracy and ultra high-speed to be required, and to supply a foil ingredient to a precision with an automatic supply means. Therefore, the tension of the foil ingredient of the preceding paragraph of a drawer means must be fixed as much as possible. It aims at offering the foil feeder and approach of enabling it to have made this invention in view of such a situation, and to give the tension of abbreviation regularity to the foil ingredient of the preceding paragraph of a drawer means.

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MEANS

[Means for Solving the Problem] Said purpose is attained by the foil feeder which has the description according to claim 1, and the foil supply approach of having the description according to claim 21.

According to the foil supply approach concerning this invention, a foil ingredient It is supplied from the supply roll by which motorised is carried out, then is guided by at least one sensor roller whose distance from at least one fixed turn roller and said at least one turn roller is adjustable. Finally it is drawn out by the drawer means. When the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, When the rate of the driving gear of said supply roll is enlarged and the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance, the rate of said driving gear is made small.

[0008] The foil feeder which starts this invention for the above-mentioned purpose The supply roll for supplying by a certain supply ability by which motorised is carried out, The consumption sensor formed between the drawer means for a certain drawer ability to perform a drawer, and said supply roll and said drawer means for controlling the drive of said supply roll according to the consumption of a foil ingredient, It changes. since -- said consumption sensor with at least one fixed turn roller At least one sensor roller supported and arranged so that it may pull out with the supply ability of a foil ingredient and the distance from said at least one turn roller may change according to a difference with ability, Change of said at least one sensor roller of the distance from said at least one turn roller is sensed. When the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, the rate of the driving gear of said supply roll is enlarged. the sensor means which makes the rate of said driving gear small when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance -- since -- it changes.

[0009] According to the approach and equipment concerning this invention, since it carries out motorised [of the supply roll], it is not necessary to add the force for drawer actuation. Therefore, even if the actual diameter of a supply roll changes with extent of rewinding [of a foil ingredient], change of the drawer force is not accepted. However, a supply roll is not driven uniformly. Moderation of rotation of a supply roll makes small distance of said at least one sensor roller and said at least one turn roller with a drawer means. Since the force given to a foil ingredient by the sensor roller here is fixed, the tension given to the foil ingredient of the preceding paragraph of a drawer means becomes fixed between said processes. Only when the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, the drive of a supply roll is accelerated by the sensor means. Then, the distance from said at least one turn roller of said at least one sensor roller increases again. However, between this process, since it is determined by the force given to a foil ingredient by the sensor roller and the spring member is not prepared, the tension of the foil ingredient of the preceding paragraph of a drawer means becomes fixed. Therefore, according to the approach and equipment concerning this invention, the tension of a foil ingredient can be kept constant in foil supply working and a usual state.

[0010] When using a large-sized and heavy supply roll, slowing down or accelerating is effective, without suspending a supply roll completely. Thereby, the force concerning the driving gear of a supply

roll decreases. Moreover, it is also possible to carry out switch-off of the supply roll completely as another gestalt, when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance, and to carry out switch-on of the supply roll again, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance. This approach is effective, when the location of a sensor roller needs to be corrected as early as possible, or when structure of a control unit needs to be simplified as much as possible.

[0011] A sensor roller may be hung freely, for example, is held by the foil. However, it is desirable by establishing a guide means, and moving said at least one sensor roller in accordance with this guide means, while the distance from said at least one turn roller is changing to guide said at least one sensor roller correctly, and to avoid malfunction by gap.

[0012] If said guide means is especially installed in an abbreviation perpendicular, it will enable a sensor roller to slide without friction of the inside of a guide means. Said at least one sensor roller can keep the tension of a foil ingredient constant with a self-weight. Moreover, you may adjust to predetermined tension by adding weight if needed.

[0013] According to the desirable gestalt, said sensor means has the 1st sensor which outputs the signal for accelerating said driving gear, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance. With another gestalt, said sensor means has the 2nd sensor which outputs the signal for decelerating said driving gear, when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance. Thus, if the 1st sensor and the 2nd sensor are formed, motor control can be performed easily.

[0014] Moreover, with another desirable gestalt, the equipment concerning this invention has the 1st insurance sensor which emits an error signal, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the minimum permissible distance. With another gestalt, said sensor means has the 2nd insurance sensor which emits an error signal, when the distance from said at least one turn roller of said at least one sensor roller exceeds maximum-permissible distance. In these further gestalten, when malfunction occurs, or when a supply roll is rewound completely, in order to emit the alarm signal for warning a worker, an error signal is emitted.

[0015] Said 1st and 2nd sensor and insurance sensor may be constituted by the mechanical switch moved by the sensor roller which moves, for example. It is desirable to, prepare an optical sensor component like [it is simple and] the optical barrier for a reliable configuration especially on the other hand. Since migration of a sensor roller is not affected in order that such an optical sensor may operate by non-contact, the tension of a foil ingredient is kept still more nearly constant.

[0016] Moreover, with the gestalt of another operation, while it is simple and acquiring reliable structure by forming a proximity switch as the 1st and 2nd sensor or an insurance sensor, it is made strong to dirt. According to the gestalt of desirable operation of the approach concerning this invention, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the minimum permissible distance, switch-off of said drawer means and the actuation section for the further processing of the supplied foil is carried out. Thereby, when malfunction occurred, or when there is [rewinding] no supply roll completely, supply actuation of the foil is suspended until actuation with normal equipment is attained again. Moreover, according to another gestalt, when the distance from said at least one turn roller of said at least one sensor roller exceeds maximum-permissible distance, switch-off of the motor of said feed roller, said drawer means, and the actuation section for the further processing of said foil is carried out. Since fault has arisen in sending out of a foil ingredient clearly when maximum-permissible distance is exceeded, in addition to suspending the further supply of the foil, switch-off of the motor of a supply roll must be carried out.

[0017] With the desirable gestalt of the equipment applied to this invention in order to realize such a gestalt of the approach concerning this invention, at least, the error signal emitted from each insurance sensor is used in order to carry out switch-off of said drawer means and the actuation section for the further processing of said foil. A drawer means is driven continuously if needed. Since the equipment and the approach of this invention are pulled out such even case and keep constant the tension of the foil

ingredient of the preceding paragraph of a means when driving a drawer means intermittently or, the equipment and the approach of this invention are effective.

[0018] In order to process the foil further, when two or more foil webs are required, the equipment concerning this invention can be repeatedly used for two or more supply means by which it was prepared by juxtaposition. For example, in order to supply a foil ingredient and to form two flank foil of a foil bag, respectively, two foil webs may be used. It is desirable to operate the motor of each supply roll separately with a common control unit.

[0019]

[Embodiment of the Invention] Hereafter, it explains in full detail about the gestalt of desirable operation of the foil feeder which starts this invention according to an accompanying drawing, and an approach. Drawing 1 and drawing 2 show the gestalt of operation of the 1st of the equipment concerning this invention. A sign 1 is a supply roll which has the diameter D which becomes small as rewinding [of the foil] progresses. The foil 15 is rewound from a supply roll 1, is led to the consumption sensor 81, and is hung on the fixed turn roller 19 and the movable sensor roller 21. Signs 67a and 67b show a drawer means typically. For example, a drawer means is a roller which contacts the foil by the friction grip and is driven at the rate according to the following foil processing actuation. Since the actual structure of the motor 3 of a supply roll 1 and the motor 69 of the drawer means 67a and 67b is not important here, these motors are shown typically. A foil ingredient moves, as shown in an arrow head 5. A sensor roller 21 is guide means 41a prepared perpendicularly in a guide frame 31, and 41b. It is supported. A trigger means 39 to pass the optical barrier 43, 45, 47, and 49, and to move onto extension of the shaft of a sensor roller 21 if a sensor roller 21 moves in the vertical direction is established. Each sensor (optical barrier 43, 45, 47, and 49) is connected to the control unit 9 of the motor 3 of a supply roll 1 through the signal line. An arrow head 35 shows vertical motion of a sensor roller 21, and an arrow head 7 shows rotation of a supply roll.

[0020] In addition, it is also possible to prepare further the adhesion for forming a junction joint in the element, for example, the foil ingredient, for processing the foil into the upstream of the drawer means 67a and 67b or a junction means, the puncher stage for forming a hole, etc. drawing 2 a It is what showed operating state with the gestalt of operation of the 1st of the equipment concerning ** and this invention, and a sensor roller 21 usually shows the lowest condition in operation, i.e., the condition of having reached the height of a sensor 47. Drawing 2 b shows the intermediate state to which the sensor roller 21 is going up between a sensor 45 and sensors 47. drawing 2 c The operating state to which ** and a sensor roller 21 have usually reached the height of the best point 45 in operation, i.e., a sensor, is shown.

[0021] Next, an operation of the gestalt of operation of the 1st of the equipment concerning this invention is explained, referring to drawing 1 and drawing 2. Drawer means 67a and 67b The friction grip between a drawer means and the foil pulls the foil ingredient 15 in the direction of an arrow head 5. In the condition that the supply roll 1 is standing it still, a sensor roller 21 is guide 41a and 41b by the drawer force. Inside is gone up. If a sensor roller 21 reaches the height of an upper photo sensor (for example, it is shown in drawing 2 c like), a trigger 39 will carry out the trigger of the optical barrier 45. If the optical barrier sends a signal to a control unit 9, a control unit 9 will start the motor 3 of a supply roll 1, and a supply roll 1 will rotate by it in the direction shown with a sign 7. The new foil ingredient 15 is supplied by this, and a sensor roller 21 descends the inside of guide 41a and 41b. If a trigger 39 reaches a sensor 47, said optical barrier will be started. In order to carry out switch-off of the motor 3 of a supply roll 1, a signal is sent to a control unit 9, consequently supply of the further foil is suspended (refer to drawing 2 a). Drawer means 67a and 67b If drawer actuation is continuing, as shown in drawing 2 b, a sensor roller 21 will go up again. If a sensor roller 21 reaches the height of a sensor 45 as mentioned above, switch-on of the motor 3 of a supply roll 1 will be carried out again.

[0022] In addition, drawer means 67a and 67b It drives continuously or intermittently. Drawer means 67a and 67b When it is made to operate intermittently, a sensor roller 21 also goes up intermittently. A foil ingredient is not supplied even if a motor 3 is operating, after a supply roll 1 is rewound completely. However, drawer means 67a and 67b It continues operating. A sensor roller 21 goes up. A trigger 39

passes the optical barrier 45. However, a foil ingredient is not supplied continuously. Consequently, a sensor roller 21 goes up further. And if a sensor roller 21 reaches the up insurance sensor 43 (for example, optical barrier), an error signal is emitted and they are drawer means 67a of a foil supply means, and 67b. Switch-off of all the included parts is carried out. Furthermore, in order to tell an operator about the new supply roll 1 needing to be inserted for example, it is also possible to emit an acoustic signal or a lightwave signal. Of course, since the fault of a supply roll stopping moving etc. occurred, also when supply of the foil stops, the insurance sensor 43 reacts.

[0023] On the other hand, if malfunction of a control unit 9 or a motor 3 occurs, when a sensor roller 21 and a trigger 39 pass a sensor 47, switch-off of the supply roll 1 may not be carried out. In such a case, a sensor roller 21 is guide 41a and 41b until it reaches the lower insurance sensor 49 (for example, optical barrier). Inside is descended further. This optical barrier is a supply roll 1, drawer means 67a, and 67b. The signal which carries out switch-off of the included whole equipment is transmitted. This switch-off is performed by intercepting a power source. Furthermore, it is also possible to emit an acoustic signal or a lightwave signal and to tell an operator about malfunction having arisen. Moreover, also when it is torn before the foil ingredient 15 reached the sensor roller 21, for example, a sensor 49 operates. Also in this case, a sensor roller 21 passes a sensor 47, even a sensor 49 descends, and it is warned of an operator by the error signal. Guide-rail 41a and 41b In the lower limit section, a sensor roller 21 stops descent on the stanchion member prepared suitably.

[0024] Next, the structure of the gestalt of another operation of equipment and the operation concerning this invention are explained, referring to drawing 3 and drawing 4. The gestalt of this operation has two foil webs which are doubled in front of the drawer means 68 and 70 and which were prolonged in parallel. Thus, in case for example, a foil bag is manufactured, it is required to supply two parallel foil webs in order to paste up two foil mutually. The foil in such a case may be laminated aluminum foil, for example. An adhesion means (not shown) etc. may be formed in the upstream of the drawer means 68 and 70, or the downstream.

[0025] Setting to drawing 3, signs 2 and 4 are diameters D1, respectively. And D2 It has and the supply roll for supplying the foil ingredients 16 and 18 is shown. A supply roll is driven by motors 6 and 8, and rotates in the direction shown with a sign 7. Motors 6 and 8 are controlled by the control unit 10 through signal lines 12 and 14, respectively. Foil 16 and 18 goes into the consumption sensors 80 and 82, respectively. Under the present circumstances, foil 16 and 18 is hung on the fixed turn rollers 20 and 24 and the movable sensor rollers 22 and 26, respectively. With the gestalt of operation shown in drawing 3, each of the consumption sensors 80 and 82 consists of three fixed turn rollers 20 and 24 and two movable sensor rollers 22 and 26. Since the movable sensor rollers 22 and 26 are mutually connected through the connection members 40 and 42, respectively, each carries out vertical migration of the sensor rollers 22 and 26 of the consumption sensors 80 and 82 at coincidence. Arrow heads 36 and 38 show actuation of the vertical direction of sensor rollers 22 and 26. Signs 44 and 50 show the insurance sensor of the upper consumption sensor 80, and signs 60 and 66 show the insurance sensor of the lower consumption sensor 82. Signs 46 and 48 show the sensor in the recurvature point of the upper and lower sides of the sensor roller 22 of the upper consumption sensor 80, and signs 62 and 64 show the sensor by which the lower consumption sensor 82 corresponds. The photo sensor is designed as for example, optical barrier. Although not shown on drawing 3, each optical barrier is connected to the control unit 10 which controls the motors 6 and 8 of supply rolls 2 and 4 through a signal line. Signs 28 and 30 show the turn roller for each foil 16 and 18 before being drawn out by the joint drawer means 68 and 70. The joint drawer means 68 and 70 are driven by the motor 72. Signs 32 and 34 show the fixed mounting means for the turn rollers 20 and 24 of each consumption sensor, respectively.

[0026] Drawing 4 shows the detail of the consumption sensor 80. The consumption sensor 82 has the same structure as the consumption sensor 80. The consumption sensors 80 and 82 and motors 6 and 8 of each foil web operate independently mutually. Drawing 4 shows the signal paths 52 and 58 for transmitting error signal F from the optical insurance sensors 44 and 50, when the connection member 40 passes the insurance sensors 44 and 50. The operation gestalt of the optical insurance sensor which carries out switch-off of the corresponding actuation section is the same as that of the case of the gestalt

of the 1st operation mentioned above. Drawing 4 shows further the signal paths 54 and 56 of the sensors 46 and 48 which perform switch-on or OFF of the motor 6 of the supply roll 2 of drawing 3. Like the gestalt of the 1st operation, if the height of a sensor roller 22 passes a photo sensor 46, switch-on of the motor 6 of a supply roll 2 will be carried out, and if the height of a sensor roller 22 passes a photo sensor 48, switch-off of the motor 6 of a supply roll 2 will be carried out. Since the fixed turn roller 20 and a sensor roller 22 are arranged in this way and it has three fixed turn rollers 20 and two sensor rollers 22, the location of a sensor roller 22 is stabilized and the induction precision of the foil improves.

[0027] Like the gestalt of the 2nd operation, in order [which is shown in drawing 1 and drawing 2] to supply two or more foil webs for the gestalt of the 1st operation, the consumption sensor of a number can be formed and used. On the other hand, a consumption sensor as shown in drawing 3 and drawing 4 can also be used in order to supply a single foil web independently. For example, in order to form the foil of the flank of the bag which stands straight, and a pars basilaris ossis occipitalis, when supplying two or more foil webs, more numbers than the number of the foil webs of consumption sensors may be formed.

[0028] In the above explanation, when the distance of a sensor roller and a turn roller exceeds the 1st predetermined distance, a supply roll is suspended completely, and although the operation in the case of driving a supply roll again was explained when the distance of a sensor roller and a turn roller became smaller than the 2nd predetermined distance, this invention is not limited to this. For example, when a supply roll may only be decelerated, without carrying out switch-off completely when the distance of a sensor roller and a turn roller exceeds the 1st predetermined distance, and the distance of a sensor roller and a turn roller becomes smaller than the 2nd predetermined distance, the mode which accelerates a supply roll is also possible. Especially in case this uses a large-sized and heavy supply roll, it is effective.

[0029] As mentioned above, with the gestalt of the 1st operation, and the gestalt of the 2nd operation, descent of sensor rollers 21 and 22 is started by the self-weight in supply actuation of the foil. the tension of a foil ingredient adjusts the weight of a sensor roller -- or it can adjust by adding weight suitably. As an example of a foil ingredient, what carried out the laminating of the sheet plastic which consists of the foil of metals, such as aluminum, polyethylene, polystyrene, polypropylene, polyethylene terephthalate, etc., and the sheet plastic, and the thing which coated the sheet plastic with metals, such as aluminum, are mentioned.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The abbreviation perspective view of the gestalt of operation of the 1st of the equipment concerning this invention

[Drawing 2] Drawing having shown various operating state of the gestalt of operation of the 1st of the equipment concerning this invention

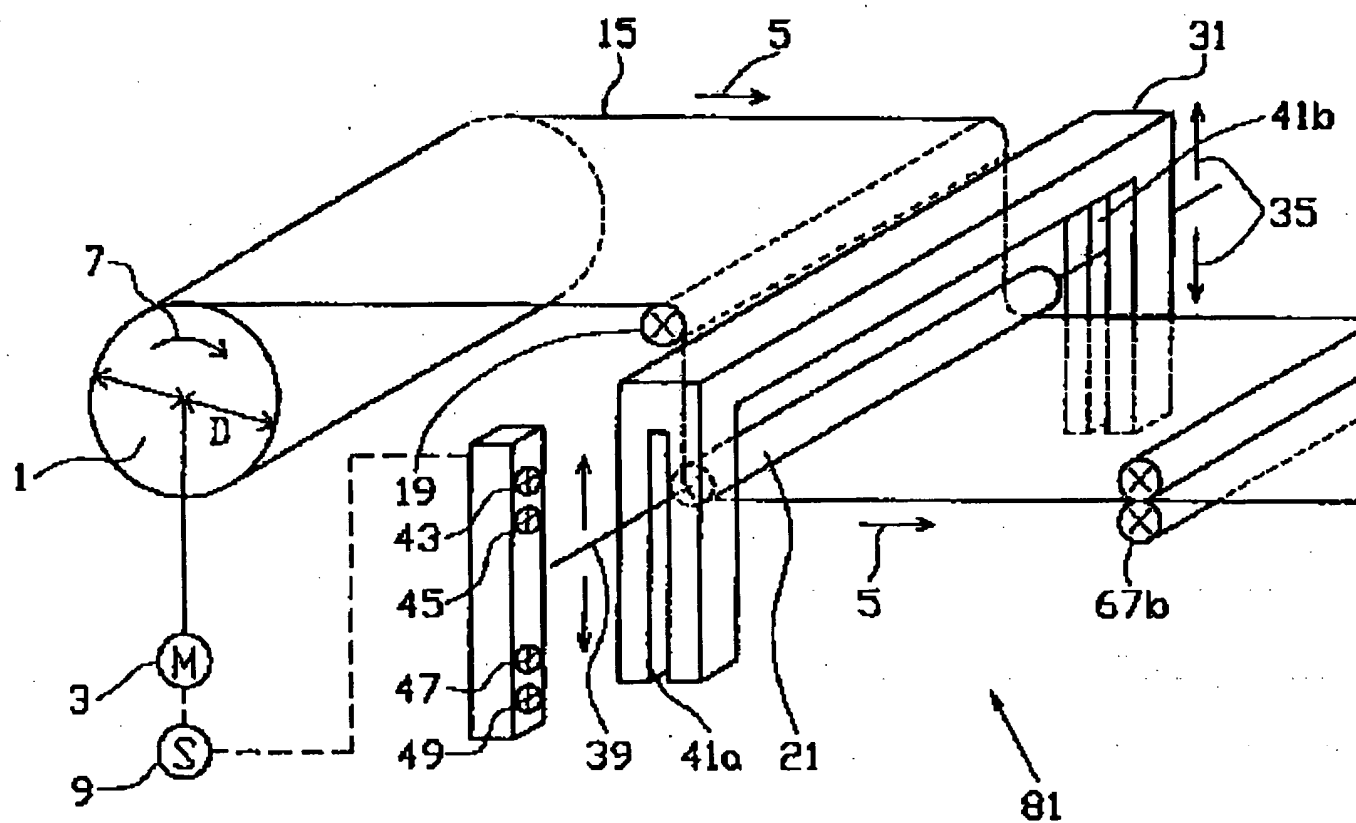
[Drawing 3] The abbreviation side elevation of the gestalt of operation of the 2nd of the equipment concerning this invention

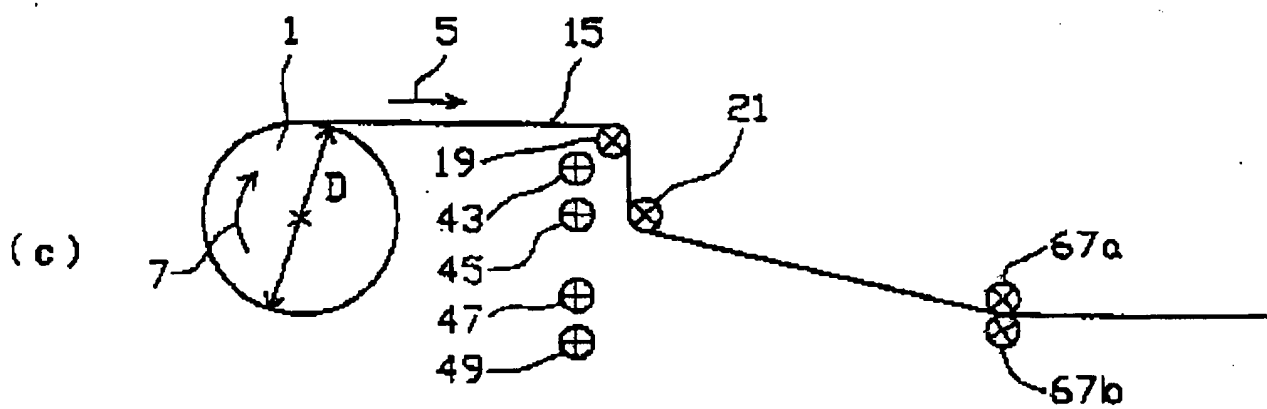
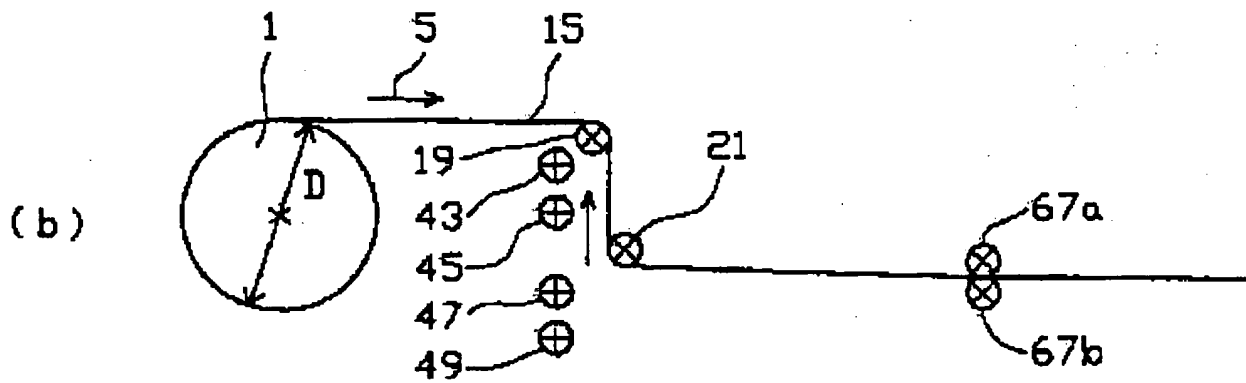
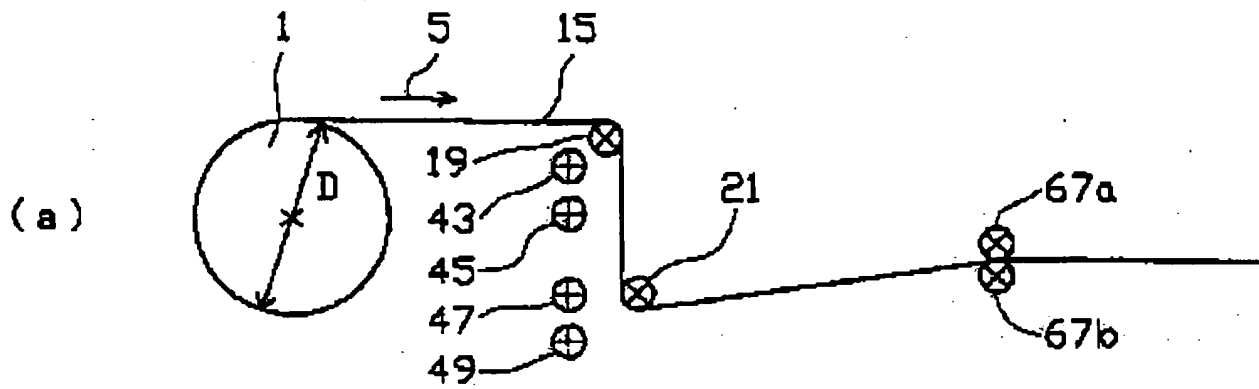
[Drawing 4] Drawing having shown the detail describing the consumption sensor of the gestalt of the 2nd operation of drawing 3

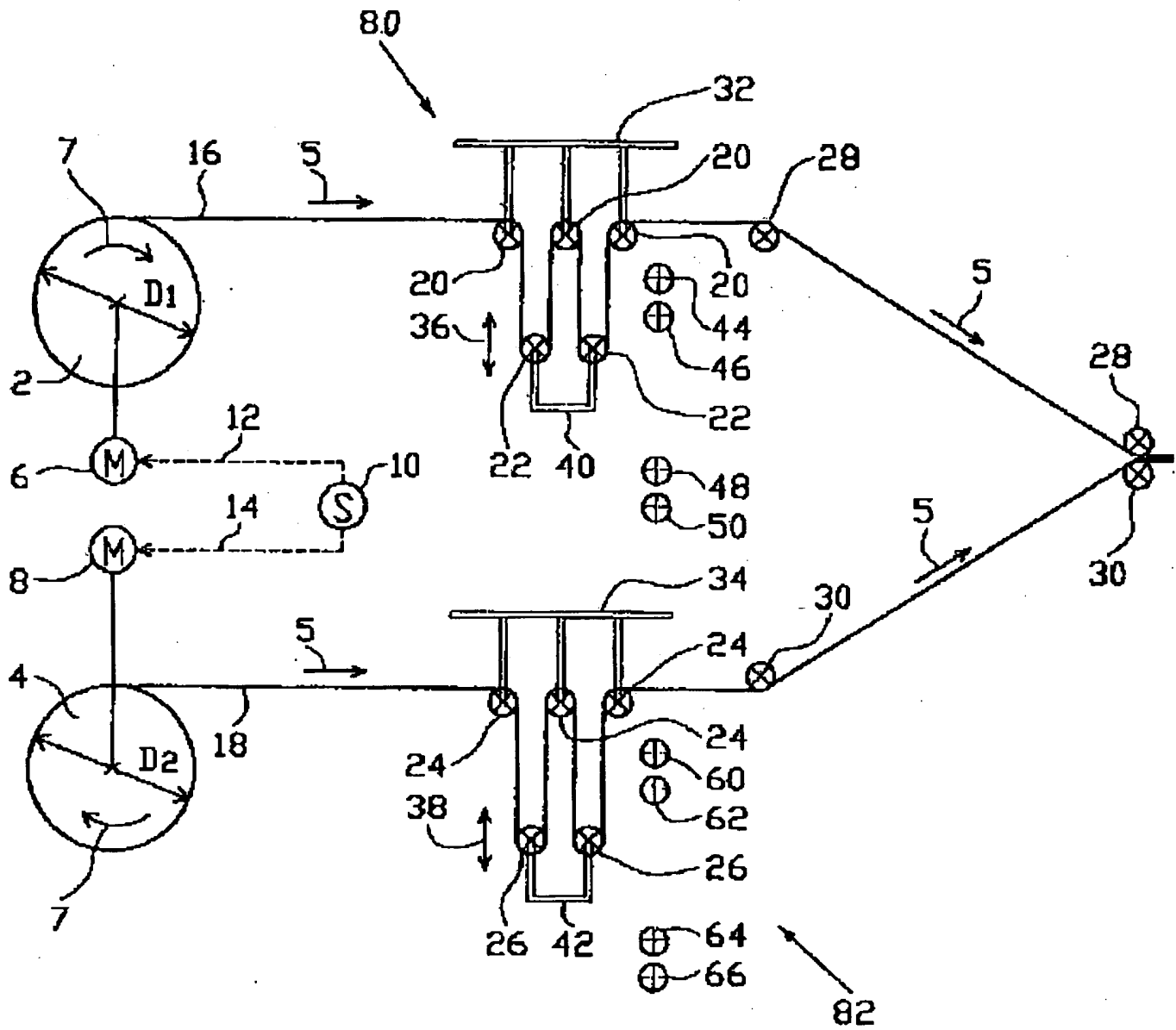
[Description of Notations]

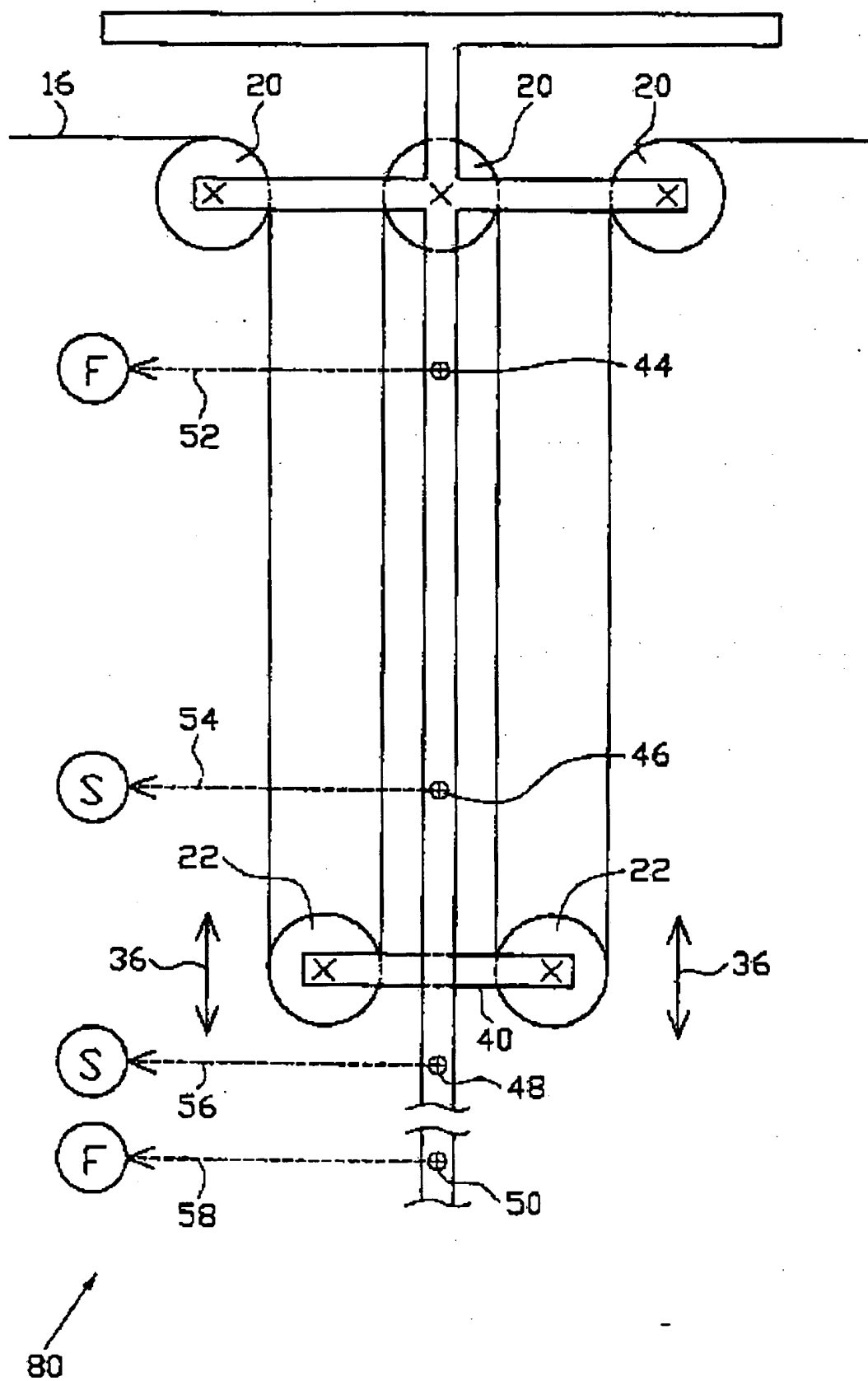
1, 2, 4 -- A supply roll, 3, 6, 8 -- A motor, 15, 16, 18 -- Foil ingredient, 19, 20, 24 -- A turn roller, 21, 22, 26 -- Sensor roller, 41a, 41b [-- A drawer means, 80, 81, 82 / -- Consumption sensor] -- A guide means, 43, 44, 49, 50, 60, 66 -- An insurance sensor, 45, 46, 47, 48, 62, 64 -- A sensor, 67a, 67b, 68, 70

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] A foil ingredient is supplied by the supply roll, and this invention is drawn out by the drawer means, for example, relates to the feeder of a foil ingredient for manufacturing a foil bag, and its approach.

[0002]

[Description of the Prior Art] In the process which pulls out since a foil ingredient is supplied as one supply roll and processed further, and is pulled out by the means, although a drawer means pulls out a foil ingredient at the rate of predetermined according to the working speed of the following processing station, tension must be given to the foil ingredient of the preceding paragraph of a drawer means. A supply roll rotates with the foil which is supported free [a revolution] and pulled out.

[0003] Such a foil supply means is required in order to manufacture for example, a foil bag. A foil bag consists of the side-face foil of two rectangles mutually pasted up in the side edge section in the condition that the bag was filled. In order to prepare the space for packing in a foil bag, the base foil, i.e., the straight foil, pastes up selectively among the four side edge sections, and it is bent. Packing is a drink etc.

[0004] With the conventional supply means, tension is given to the foil of the preceding paragraph of a drawer means by the so-called tensor means. The foil is guided with two or more fixed rollers and movable rollers which were arranged by turns. A movable roller is energized by the spring force it is so large that the distance of a movable roller and a fixed turn roller becomes small weak. Thereby, tension is always given to the foil.

[0005]

[Problem(s) to be Solved by the Invention] With the above conventional supply means, since the diameter of a supply roll becomes small as a foil ingredient is rewound, the drawer force required in order to pull out the foil ingredient of a constant rate from a supply roll is not fixed, and the torque which should be given also changes along with it. Since the spring force of acting on a movable roller is proportional to expanding of the longitudinal direction of a spring and the force which a tensor means does to a foil ingredient will also change on the other hand if the distance of a movable roller and a fixed turn roller changes, the tension of the foil is not fixed.

[0006] However, for manufacture of a foil bag, it is dramatically important for high degree of accuracy and ultra high-speed to be required, and to supply a foil ingredient to a precision with an automatic supply means. Therefore, the tension of the foil ingredient of the preceding paragraph of a drawer means must be fixed as much as possible. This invention is [0007] aiming at offering the foil feeder and approach of making it possible to have been made in view of such a situation and to give the tension of abbreviation regularity to the foil ingredient of the preceding paragraph of a drawer means.

[Means for Solving the Problem] Said object is attained by the foil feeder which has the description according to claim 1, and the foil supply approach of having the description according to claim 21. According to the foil supply approach concerning this invention, a foil ingredient It is supplied from the

supply roll by which motorised is carried out, then is guided by at least one sensor roller whose distance from at least one fixed turn roller and said at least one turn roller is adjustable. Finally it is drawn out by the drawer means. When the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, When the rate of the driving gear of said supply roll is enlarged and the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance, the rate of said driving gear is made small.

[0008] The foil feeder which starts this invention for the above-mentioned object The supply roll for supplying by a certain supply ability by which motorised is carried out, The consumption sensor formed between the drawer means for a certain drawer ability to perform a drawer, and said supply roll and said drawer means for controlling actuation of said supply roll according to the consumption of a foil ingredient, It changes. since -- said consumption sensor with at least one fixed turn roller At least one sensor roller supported and arranged so that it may pull out with the supply ability of a foil ingredient and the distance from said at least one turn roller may change according to a difference with ability, Change of said at least one sensor roller of the distance from said at least one turn roller is sensed. When the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, the rate of the driving gear of said supply roll is enlarged. the sensor means which makes the rate of said driving gear small when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance -- since -- it changes.

[0009] According to the approach and equipment concerning this invention, since it carries out motorised [of the supply roll], it is not necessary to add the force for drawer actuation. Therefore, even if the actual diameter of a supply roll changes with extent of rewinding [of a foil ingredient], change of the drawer force is not accepted. However, a supply roll is not driven uniformly. A slowdown of a revolution of a supply roll makes small distance of said at least one sensor roller and said at least one turn roller with a drawer means. Since the force given to a foil ingredient by the sensor roller here is fixed, the tension given to the foil ingredient of the preceding paragraph of a drawer means becomes fixed between said processes. Only when the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance, actuation of a supply roll is accelerated by the sensor means. Then, the distance from said at least one turn roller of said at least one sensor roller increases again. However, between this process, since it is determined by the force given to a foil ingredient by the sensor roller and the spring member is not prepared, the tension of the foil ingredient of the preceding paragraph of a drawer means becomes fixed. Therefore, according to the approach and equipment concerning this invention, the tension of a foil ingredient can be kept constant in foil supply working and a usual state.

[0010] When using a large-sized and heavy supply roll, slowing down or accelerating is effective, without suspending a supply roll thoroughly. Thereby, the force concerning the driving gear of a supply roll decreases. Moreover, it is also possible to carry out switch-off of the supply roll thoroughly as another gestalt, when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance, and to carry out switch-on of the supply roll again, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance. This approach is effective, when the location of a sensor roller needs to be corrected as early as possible, or when structure of a control unit needs to be simplified as much as possible.

[0011] A sensor roller may be hung freely, for example, is held by the foil. However, it is desirable by establishing a guide means, and moving said at least one sensor roller in accordance with this guide means, while the distance from said at least one turn roller is changing to guide said at least one sensor roller to accuracy, and to avoid malfunction by gap.

[0012] If said guide means is especially installed in an abbreviation perpendicular, it will enable a sensor roller to slide without friction of the inside of a guide means. Said at least one sensor roller can keep the tension of a foil ingredient constant with a self-weight. Moreover, you may adjust to predetermined tension by adding weight if needed.

[0013] According to the desirable gestalt, said sensor means has the 1st sensor which outputs the signal

for accelerating said driving gear, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the 1st predetermined distance. With another gestalt, said sensor means has the 2nd sensor which outputs the signal for decelerating said driving gear, when the distance from said at least one turn roller of said at least one sensor roller exceeds the 2nd predetermined distance. Thus, if the 1st sensor and the 2nd sensor are formed, motor control can be performed easily.

[0014] Moreover, with another desirable gestalt, the equipment concerning this invention has the 1st insurance sensor which emits an error signal, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the minimum permissible distance. With another gestalt, said sensor means has the 2nd insurance sensor which emits an error signal, when the distance from said at least one turn roller of said at least one sensor roller exceeds maximum-permissible distance. In these further gestalten, when malfunction occurs, or when a supply roll is rewound thoroughly, in order to emit the alarm signal for warning authorized personnel, an error signal is emitted.

[0015] Said 1st and 2nd sensor and insurance sensor may be constituted by the mechanical switch moved by the sensor roller which moves, for example. It is desirable to, prepare an optical sensor component like [it is simple and] the optical barrier for a reliable configuration especially on the other hand. Since migration of a sensor roller is not affected in order that such an optical sensor may operate by non-contact, the tension of a foil ingredient is kept still more nearly constant.

[0016] Moreover, with the gestalt of another operation, while it is simple and acquiring reliable structure by forming a proximity switch as the 1st and 2nd sensor or an insurance sensor, it is made strong to dirt. According to the gestalt of desirable operation of the approach concerning this invention, when the distance from said at least one turn roller of said at least one sensor roller is smaller than the minimum permissible distance, switch-off of said drawer means and the actuation section for the further processing of the supplied foil is carried out. Thereby, when malfunction occurred, or when there is [rewinding] no supply roll thoroughly, supply actuation of the foil is suspended until actuation with normal equipment is attained again. Moreover, according to another gestalt, when the distance from said at least one turn roller of said at least one sensor roller exceeds maximum-permissible distance, switch-off of the motor of said feed roller, said drawer means, and the actuation section for the further processing of said foil is carried out. Since nonconformity has arisen in sending out of a foil ingredient clearly when maximum-permissible distance is exceeded, in addition to suspending the further supply of the foil, switch-off of the motor of a supply roll must be carried out.

[0017] With the desirable gestalt of the equipment applied to this invention in order to realize such a gestalt of the approach concerning this invention, at least, the error signal emitted from each insurance sensor is used in order to carry out switch-off of said drawer means and the actuation section for the further processing of said foil. A drawer means is driven continuously if needed. Since the equipment and the approach of this invention are pulled out such even case and keep constant the tension of the foil ingredient of the preceding paragraph of a means when driving a drawer means intermittently or, the equipment and the approach of this invention are effective.

[0018] In order to process the foil further, when two or more foil webs are required, the equipment concerning this invention can be repeatedly used for two or more supply means by which it was prepared by juxtaposition. For example, in order to supply a foil ingredient and to form two flank foil of a foil bag, respectively, two foil webs may be used. It is desirable to operate the motor of each supply roll separately with a common control unit.

[0019]

[Embodiment of the Invention] Hereafter, it explains in full detail about the gestalt of desirable operation of the foil feeder which starts this invention according to an accompanying drawing, and an approach. Drawing 1 and drawing 2 show the gestalt of operation of the 1st of the equipment concerning this invention. A sign 1 is a supply roll which has the diameter D which becomes small as rewinding [of the foil] progresses. The foil 15 is rewound from a supply roll 1, is led to the consumption sensor 81, and is hung on the fixed turn roller 19 and the movable sensor roller 21. Signs 67a and 67b show a drawer means typically. For example, a drawer means is a roller which contacts the foil by the friction grip and is driven at the rate according to the following foil processing actuation. Since the actual

structure of the motor 3 of a supply roll 1 and the motor 69 of the drawer means 67a and 67b is not important here, these motors are shown typically. A foil ingredient moves, as shown in an arrow head 5. A sensor roller 21 is guide means 41a prepared vertically in a guide frame 31, and 41b. It is supported. A trigger means 39 to pass the optical barrier 43, 45, 47, and 49, and to move onto extension of the shaft of a sensor roller 21 if a sensor roller 21 moves in the vertical direction is established. Each sensor (optical barrier 43, 45, 47, and 49) is connected to the control unit 9 of the motor 3 of a supply roll 1 through the signal line. An arrow head 35 shows vertical motion of a sensor roller 21, and an arrow head 7 shows rotation of a supply roll.

[0020] In addition, it is also possible to prepare further the adhesion for forming a junction joint in the element, for example, the foil ingredient, for processing the foil into the upstream of the drawer means 67a and 67b or a junction means, the puncher stage for forming a hole, etc. drawing 2 a It is what showed operating state with the gestalt of operation of the 1st of the equipment concerning ** and this invention, and a sensor roller 21 usually shows the lowest condition in operation, i.e., the condition of having reached the height of a sensor 47. Drawing 2 b shows the intermediate state to which the sensor roller 21 is going up between a sensor 45 and sensors 47. drawing 2 c The operating state to which ** and a sensor roller 21 have usually reached the height of the best point 45 in operation, i.e., a sensor, is shown.

[0021] Next, an operation of the gestalt of operation of the 1st of the equipment concerning this invention is explained, referring to drawing 1 and drawing 2. Drawer means 67a and 67b The friction grip between a drawer means and the foil pulls the foil ingredient 15 in the direction of an arrow head 5. In the condition that the supply roll 1 is standing it still, a sensor roller 21 is guide 41a and 41b by the drawer force. Inside is gone up. If a sensor roller 21 reaches the height of an upper photo sensor (for example, it is shown in drawing 2 c like), a trigger 39 will carry out the trigger of the optical barrier 45. If the optical barrier sends a signal to a control unit 9, a control unit 9 will start the motor 3 of a supply roll 1, and a supply roll 1 will rotate by it in the direction shown with a sign 7. The new foil ingredient 15 is supplied by this, and a sensor roller 21 descends the inside of guide 41a and 41b. If a trigger 39 reaches a sensor 47, said optical barrier will be started. In order to carry out switch-off of the motor 3 of a supply roll 1, a signal is sent to a control unit 9, consequently supply of the further foil is suspended (refer to drawing 2 a). Drawer means 67a and 67b If drawer actuation is continuing, as shown in drawing 2 b, a sensor roller 21 will go up again. If a sensor roller 21 reaches the height of a sensor 45 as mentioned above, switch-on of the motor 3 of a supply roll 1 will be carried out again.

[0022] In addition, drawer means 67a and 67b It drives continuously or intermittently. Drawer means 67a and 67b When it is made to operate intermittently, a sensor roller 21 also goes up intermittently. A foil ingredient is not supplied even if a motor 3 is operating, after a supply roll 1 is rewound thoroughly. However, drawer means 67a and 67b It continues operating. A sensor roller 21 goes up. A trigger 39 passes the optical barrier 45. However, a foil ingredient is not supplied continuously. Consequently, a sensor roller 21 goes up further. And if a sensor roller 21 reaches the up insurance sensor 43 (for example, optical barrier), an error signal is emitted and they are drawer means 67a of a foil supply means, and 67b. Switch-off of all the included parts is carried out. Furthermore, in order to tell an operator about the new supply roll 1 needing to be inserted for example, it is also possible to emit an acoustic signal or a lightwave signal. Of course, since the nonconformity of a supply roll stopping moving etc. occurred, also when supply of the foil stops, the insurance sensor 43 reacts.

[0023] On the other hand, if malfunction of a control unit 9 or a motor 3 occurs, when a sensor roller 21 and a trigger 39 pass a sensor 47, switch-off of the supply roll 1 may not be carried out. In such a case, a sensor roller 21 is guide 41a and 41b until it reaches the lower insurance sensor 49 (for example, optical barrier). Inside is descended further. This optical barrier is a supply roll 1, drawer means 67a, and 67b. The signal which carries out switch-off of the included whole equipment is transmitted. This switch-off is performed by intercepting a power source. Furthermore, it is also possible to emit an acoustic signal or a lightwave signal and to tell an operator about malfunction having arisen. Moreover, also when it is torn before the foil ingredient 15 reached the sensor roller 21, for example, a sensor 49 operates. Also in this case, a sensor roller 21 passes a sensor 47, even a sensor 49 descends, and it is warned of an

operator by the error signal. Guide-rail 41a and 41b In the soffit section, a sensor roller 21 stops descent on the stanchion member prepared suitably.

[0024] Next, the structure of the gestalt of another operation of equipment and the operation concerning this invention are explained, referring to drawing 3 and drawing 4 . The gestalt of this operation has two foil webs prolonged in the parallel doubled in front of the drawer means 68 and 70. Thus, in case for example, a foil bag is manufactured, it is required to supply two parallel foil webs in order to paste up two foil mutually. The foil in such a case may be laminated aluminum foil, for example. An adhesion means (not shown) etc. may be formed in the upstream of the drawer means 68 and 70, or the downstream.

[0025] Setting to drawing 3 , signs 2 and 4 are diameters D1, respectively. And D2 It has and the supply roll for supplying the foil ingredients 16 and 18 is shown. A supply roll is driven by motors 6 and 8, and rotates in the direction shown with a sign 7. Motors 6 and 8 are controlled by the control unit 10 through signal lines 12 and 14, respectively. Foil 16 and 18 goes into the consumption sensors 80 and 82, respectively. Under the present circumstances, foil 16 and 18 is hung on the fixed turn rollers 20 and 24 and the movable sensor rollers 22 and 26, respectively. With the gestalt of operation shown in drawing 3 , each of the consumption sensors 80 and 82 consists of three fixed turn rollers 20 and 24 and two movable sensor rollers 22 and 26. Since the movable sensor rollers 22 and 26 are mutually connected through the connection members 40 and 42, respectively, each carries out vertical migration of the sensor rollers 22 and 26 of the consumption sensors 80 and 82 simultaneously. Arrow heads 36 and 38 show actuation of the vertical direction of sensor rollers 22 and 26. Signs 44 and 50 show the insurance sensor of the upper consumption sensor 80, and signs 60 and 66 show the insurance sensor of the lower consumption sensor 82. Signs 46 and 48 show the sensor in the recurvature point of the upper and lower sides of the sensor roller 22 of the upper consumption sensor 80, and signs 62 and 64 show the sensor by which the lower consumption sensor 82 corresponds. The photo sensor is designed as for example, optical barrier. Although not shown on drawing 3 , each optical barrier is connected to the control unit 10 which controls the motors 6 and 8 of supply rolls 2 and 4 through a signal line. Signs 28 and 30 show the turn roller for each foil 16 and 18 before being drawn out by the joint drawer means 68 and 70. The joint drawer means 68 and 70 are driven by the motor 72. Signs 32 and 34 show the fixed mounting means for the turn rollers 20 and 24 of each consumption sensor, respectively.

[0026] Drawing 4 shows the detail of the consumption sensor 80. The consumption sensor 82 has the same structure as the consumption sensor 80. The consumption sensors 80 and 82 and motors 6 and 8 of each foil web operate independently mutually. Drawing 4 shows the signal paths 52 and 58 for transmitting error signal F from the optical insurance sensors 44 and 50, when the connection member 40 passes the insurance sensors 44 and 50. The operation gestalt of the optical insurance sensor which carries out switch-off of the corresponding actuation section is the same as that of the gestalt of the 1st operation mentioned above. Drawing 4 shows further the signal paths 54 and 56 of the sensors 46 and 48 which perform switch-on or OFF of the motor 6 of the supply roll 2 of drawing 3 . Like the gestalt of the 1st operation, if the height of a sensor roller 22 passes a photo sensor 46, switch-on of the motor 6 of a supply roll 2 will be carried out, and if the height of a sensor roller 22 passes a photo sensor 48, switch-off of the motor 6 of a supply roll 2 will be carried out. Since the fixed turn roller 20 and a sensor roller 22 are arranged in this way and it has three fixed turn rollers 20 and two sensor rollers 22, the location of a sensor roller 22 is stabilized and the induction precision of the foil improves.

[0027] Like the gestalt of the 2nd operation, in order [which is shown in drawing 1 and drawing 2] to supply two or more foil webs for the gestalt of the 1st operation, the consumption sensor of a number can be formed and used. On the other hand, a consumption sensor as shown in drawing 3 and drawing 4 can also be used in order to supply a single foil web independently. For example, in order to form the foil of the flank of the bag which stands straight, and a pars basilaris ossis occipitalis, when supplying two or more foil webs, more numbers than the number of the foil webs of consumption sensors may be formed.

[0028] In the above explanation, when the distance of a sensor roller and a turn roller exceeds the 1st predetermined distance, a supply roll is suspended thoroughly, and although the operation in the case of

driving a supply roll again was explained when the distance of a sensor roller and a turn roller became smaller than the 2nd predetermined distance, this invention is not limited to this. For example, when a supply roll may only be decelerated, without carrying out switch-off thoroughly when the distance of a sensor roller and a turn roller exceeds the 1st predetermined distance, and the distance of a sensor roller and a turn roller becomes smaller than the 2nd predetermined distance, the mode which accelerates a supply roll is also possible. Especially in case this uses a large-sized and heavy supply roll, it is effective.

[0029] As mentioned above, with the gestalt of the 1st operation, and the gestalt of the 2nd operation, descent of sensor rollers 21 and 22 is started by the self-weight in supply actuation of the foil. the tension of a foil ingredient adjusts the weight of a sensor roller -- or it can adjust by adding weight suitably. As an example of a foil ingredient, what carried out the laminating of the plastic sheet which consists of the foil of metals, such as aluminum, polyethylene, polystyrene, polypropylene, polyethylene terephthalate, etc., and the plastic sheet, and the thing which coated the plastic sheet with metals, such as aluminum, are mentioned.

[0030]

[Effect of the Invention] Since the sensor roller is carried on each foil with additional weight only with the appropriate self-weight according to the foil feeder and approach concerning this invention as explained above, the force concerning the foil is fixed and becomes fixed [the tension of the foil of the preceding paragraph of a drawer means]. Thereby, a foil ingredient can be supplied with a sufficient precision and the very high working speed which serves as a criterion with the present foil processing line can be maintained.

[Translation done.]

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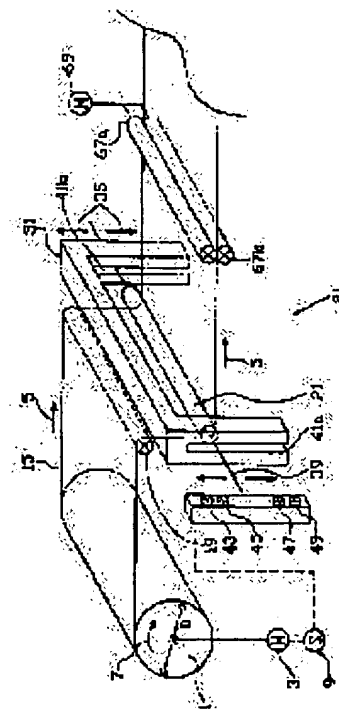
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(54) FOIL SUPPLY DEVICE AND METHOD THEREFOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a foil supply device and a method therefor capable of giving substantially fixed tensile force for a foil material at a previous step of a pull-out means.

SOLUTION: This foil material supply device consists of a supply roll 1, pull-out means 67a, 67b, a consumption amount sensor 81 which controls the drive of the supply roll 1 in accordance with a consumption amount of a foil material and is provided between the supply roll 1 and the pull-out means 67a, 67b, a deflection roller 19, a sensor roller 21, and a sensor means. The sensor roller 21 is supported and arranged in such a way that a distance from the deflection roller 19 is changed in accordance with a difference between a supply function and a pull-out function of the foil material 15. The sensor means senses changes of the distance from the deflection roller 19 of the sensor roller 21, accelerates the supply roll 1 when the distance from the deflection roller 19 of the sensor roller 21 is smaller than a first predetermined distance, and decelerates the supply roller 19 when the distance from the deflection roller 19 of the sensor roller 21 exceeds a second predetermined distance.



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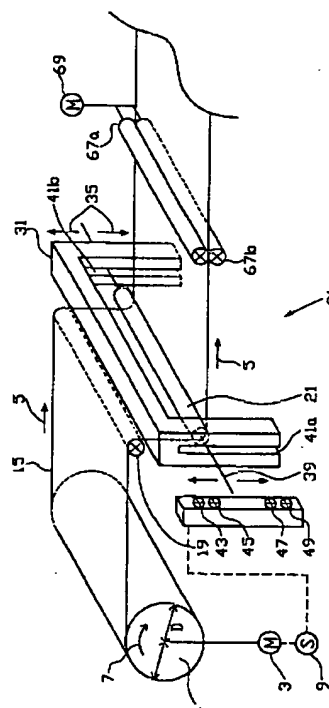
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(54) 【発明の名称】 フォイル供給装置及び方法

(57) 【要約】

【課題】引き出し手段の前段のフォイル材料に対し略一定の張力を与えることを可能とするフォイル供給装置及び方法を提供する。

【解決手段】本発明のフォイル材料供給装置は、供給ロール1と、引き出し手段67a、67bと、フォイル材料の消費量に応じて供給ロール1の駆動を制御するための、供給ロール1と引き出し手段67a、67bとの間に設けられた消費量センサ81と、転向ローラ19と、センサローラ21と、センサ手段と、から成り、センサローラ21は、フォイル材料15の供給能と引き出し能との差にしたがって転向ローラ19からの距離が変化するように支持され配置され、センサ手段は、センサローラ21の転向ローラ19からの距離の変化を感知して、センサローラ21の転向ローラ19からの距離が第1所定距離よりも小さいときに供給ロール1を加速させ、センサローラ21の転向ローラ19からの距離が第2所定距離を超えるとときに供給ロール19を減速させる。



【特許請求の範囲】

【請求項1】 フォイルバッグを製造するため等に、フォイル材料を供給するためのフォイル供給装置であって、ある供給能によってフォイル材料を供給するためのモータ駆動される供給ロールと、ある引き出し能によってフォイル材料を引き出すための引き出し手段と、フォイル材料の消費量に応じて前記供給ロールの駆動を制御するための、前記供給ロールと前記引き出し手段との間に設けられた消費量センサと、から成り、

前記消費量センサは、

少なくとも一つの固定された転向ローラと、

フォイル材料の供給能と引き出し能との差にしたがって前記少なくとも一つの転向ローラからの距離が変化するように支持され配置された、少なくとも一つのセンサローラと、

前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離の変化を感知して、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離よりも小さいときに前記供給ロールの駆動装置の速度を大きくし、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第2所定距離を超えるとときに前記駆動装置の速度を小さくする、センサ手段と、から成る、ことを特徴とするフォイル供給装置。

【請求項2】 前記センサ手段は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が前記第2所定距離を超えるとときに、前記供給ロールの前記駆動装置をスイッチオフすることを特徴とする請求項1に記載のフォイル供給装置。

【請求項3】 ガイド手段が設けられ、前記少なくとも一つのセンサローラは、前記少なくとも一つの転向ローラからの距離が変化する間、前記ガイド手段に沿って移動することを特徴とする請求項1又は2に記載のフォイル供給装置。

【請求項4】 前記ガイド手段は略垂直に設けられることを特徴とする請求項3に記載のフォイル供給装置。

【請求項5】 前記少なくとも一つのセンサローラに重りが追加されることを特徴とする請求項1乃至4のいずれかに記載のフォイル供給装置。

【請求項6】 前記転向ローラの数前記センサローラの数より一つだけ多く、前記フォイル材料は、前記転向ローラ及び前記センサローラに交互に掛けられることを特徴とする請求項1乃至5のいずれかに記載のフォイル供給装置。

【請求項7】 相互に連結された少なくとも二つのセンサローラが設けられることを特徴とする請求項6に記載のフォイル供給装置。

【請求項8】 前記センサ手段は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が前記第1所定距離より小さいときに前記駆動装

置を加速させるための信号を出力する、第1センサを備えることを特徴とする請求項1乃至7のいずれかに記載のフォイル供給装置。

【請求項9】 前記センサ手段は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が前記第2所定距離を超えるとときに前記駆動装置を減速させるための信号を出力する、第2センサを備えることを特徴とする請求項1乃至8のいずれかに記載のフォイル供給装置。

【請求項10】 前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最小許容距離よりも小さいときにエラー信号を発する、第1安全センサを備えることを特徴とする請求項1乃至9のいずれかに記載のフォイル供給装置。

【請求項11】 前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最大許容距離よりも大きいときにエラー信号を発する、第2安全センサを備えることを特徴とする請求項1乃至10のいずれかに記載のフォイル供給装置。

【請求項12】 前記安全センサは、近接スイッチから成ることを特徴とする請求項10又は11に記載のフォイル供給装置。

【請求項13】 前記安全センサは、光学センサ素子から成ることを特徴とする請求項10又は11に記載のフォイル供給装置。

【請求項14】 前記第1及び第2センサのうち少なくとも一方は、近接スイッチから成ることを特徴とする請求項1乃至13のいずれかに記載のフォイル供給装置。

【請求項15】 前記第1及び第2センサのうち少なくとも一方は、光学センサ素子から成ることを特徴とする請求項1乃至14のいずれかに記載のフォイル供給装置。

【請求項16】 前記光学センサ素子は、光バリアから成ることを特徴とする請求項13又は15に記載のフォイル供給装置。

【請求項17】 前記エラー信号は、少なくとも、前記引き出し手段と供給されたフォイルの更なる加工のための作動部とをスイッチオフするために用いられることを特徴とする請求項10又は11に記載のフォイル供給装置。

【請求項18】 前記引き出し手段は、断続的に駆動されることを特徴とする請求項1乃至17のいずれかに記載のフォイル供給装置。

【請求項19】 少なくとも二つのモータ駆動される供給ロール及び消費量センサが、少なくとも二つのフォイルウェブを供給可能なように設けられることを特徴とする請求項1乃至18のいずれかに記載のフォイル供給装置。

【請求項20】 前記供給ロールの前記モータは、対応する前記消費量センサの前記センサ手段から前記信号を

受け取る共通の制御ユニットによって駆動されることを特徴とする請求項19に記載のフォイル供給装置。

【請求項21】 フォイルバッグの製造等におけるフォイル材料供給方法において、
フォイル材料は、モータ駆動される供給ロールから供給され、

続いて、少なくとも一つの固定された転向ローラ及び前記少なくとも一つの転向ローラからの距離が可変である少なくとも一つのセンサローラによってガイドされ、最後に、引き出し手段によって引き出され、
前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離よりも小さいとき、前記供給ロールの駆動装置の速度が大きされ、
前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第2所定距離を超えると、前記駆動装置の速度が小さされる、
ことを特徴とするフォイル供給方法。

【請求項22】 前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が前記第2所定距離を超えると、前記供給ロールの前記駆動装置がスイッチオフされることを特徴とする請求項21記載のフォイル供給方法。

【請求項23】 前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最小許容距離よりも小さいとき、少なくとも、前記引き出し手段と供給されたフォイルの更なる加工のための作動部とがスイッチオフされることを特徴とする請求項21又は22に記載のフォイル供給方法。

【請求項24】 前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最大許容距離を超えると、少なくとも、前記供給ロールの前記駆動装置と、前記引き出し手段と、前記フォイルの更なる加工のための作動部と、がスイッチオフされることを特徴とする請求項21乃至23のいずれかに記載のフォイル供給方法。

【請求項25】 前記フォイルは、前記引き出し手段によって断続的に引き出されることを特徴とする請求項21乃至24のいずれかに記載のフォイル供給方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、フォイル材料が供給ロールによって供給され引き出し手段によって引き出される、例えばフォイルバッグを製造するための、フォイル材料の供給装置及びその方法に関する。

【0002】

【従来の技術】フォイル材料が、一本の供給ロールとして供給され、更に加工されるために引き出し手段によって引き出される工程において、引き出し手段は、後に続く加工ステーションの加工速度に合わせて所定の速度でフォイル材料を引き出すが、引き出し手段の前段のフォ

イル材料には、張力が与えられなければならない。供給ロールは回転自在に支持され、引き出されるフォイルによって回転される。

【0003】このようなフォイル供給手段は、例えば、フォイルバッグを製造するために必要である。フォイルバッグは、例えば、バッグが満たされた状態において側縁部で相互に接着されている、二つの矩形の側面フォイルから成る。フォイルバッグ内に充填物のための空間を設けるために、底面フォイルすなわち直立フォイルが、四つの側縁部の間に選択的に接着され、折り曲げられる。充填物は、例えば、飲料等である。

【0004】従来の供給手段では、いわゆるテンソル手段によって、引き出し手段の前段のフォイルに張力が与えられる。フォイルは、交互に配設された複数の固定ローラ及び可動ローラによってガイドされる。可動ローラは、可動ローラと固定転向ローラとの距離が小さくなる程大きくなるバネ力によって、付勢される。これにより、フォイルには常に張力が与えられる。

【0005】

【発明が解決しようとする課題】上記のような従来の供給手段では、フォイル材料が巻き戻されるにつれて供給ロールの直径が小さくなるため、供給ロールから一定量のフォイル材料を引き出すために必要な引き出し力は一定せず、与えられるべきトルクもそれにつれて変化する。一方、可動ローラに作用するバネ力はバネの長手方向の伸長に比例するため、可動ローラと固定転向ローラとの距離が変化するとテンソル手段がフォイル材料に対して及ぼす力も変化するので、フォイルの張力は一定しない。

【0006】しかしながら、フォイルバッグの製造のためには、自動供給手段では高精度かつ超高速が必要であり、フォイル材料を精密に供給することが非常に重要である。したがって、引き出し手段の前段のフォイル材料の張力は、できるだけ一定でなければならない。本発明はこのような事情に鑑みてなされたもので、引き出し手段の前段のフォイル材料に対し略一定の張力を与えることを可能とするフォイル供給装置及び方法を提供することを目的とする

【0007】

【課題を解決するための手段】前記目的は、請求項1に記載の特徴を有するフォイル供給装置、及び請求項21に記載の特徴を有するフォイル供給方法によって達成される。本発明に係るフォイル供給方法によれば、フォイル材料は、モータ駆動される供給ロールから供給され、続いて、少なくとも一つの固定された転向ローラ及び前記少なくとも一つの転向ローラからの距離が可変である少なくとも一つのセンサローラによってガイドされ、最後に、引き出し手段によって引き出され、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離よりも小さいとき、前記供

給ロールの駆動装置の速度が大きくされ、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第2所定距離を超えると、前記駆動装置の速度が小さくされる。

【0008】上記目的のために、本発明に係るフォイル供給装置は、ある供給能によって供給を行うためのモータ駆動される供給ロールと、ある引き出し能によって引き出しを行うための引き出し手段と、フォイル材料の消費量に応じて前記供給ロールの駆動を制御するための、前記供給ロールと前記引き出し手段との間に設けられた消費量センサと、から成り、前記消費量センサは、少なくとも一つの固定された転向ローラと、フォイル材料の供給能と引き出し能との差にしたがって前記少なくとも一つの転向ローラからの距離が変化するように支持され配置された、少なくとも一つのセンサローラと、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離の変化を感知して、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離よりも小さいときに前記供給ロールの駆動装置の速度を大きくし、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第2所定距離を超えると前記駆動装置の速度を小さくする、センサ手段と、から成る。

【0009】本発明に係る方法及び装置によれば、供給ロールをモータ駆動するので、引き出し動作のために力を追加する必要がない。したがって、フォイル材料の巻き戻しの程度によって供給ロールの実際の直径が変化しても、引き出し力の変化は認められない。しかしながら、供給ロールは一定に駆動されるものではない。供給ロールの回転が減速されると、引き出し手段によって、前記少なくとも一つのセンサローラと前記少なくとも一つの転向ローラとの距離が小さくされる。ここでセンサローラによってフォイル材料に与えられる力は一定であるため、引き出し手段の前段のフォイル材料に与えられる張力は、前記工程の間、一定となる。前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離よりも小さいときにのみ、センサ手段によって供給ロールの駆動が加速される。その後、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離は再び増加してゆく。しかしながら、この工程の間、引き出し手段の前段のフォイル材料の張力は、センサローラによってフォイル材料に与えられる力によって決定されるので、バネ部材が設けられていないために、一定となる。したがって、本発明に係る方法及び装置によれば、フォイル供給動作中、常にフォイル材料の張力を一定に保つことができる。

【0010】大型で重い供給ロールを使用する場合には、供給ロールを完全に停止することなく減速又は加速することが有効である。これにより、供給ロールの駆動装置にかかる力が減少する。また別の形態として、前記

少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第2所定距離を超えると供給ロールを完全にスイッチオフし、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離よりも小さいときに供給ロールを再びスイッチオンすることも可能である。センサローラの位置をできるだけ早く修正する必要がある場合、あるいは、制御ユニットの構造をできるだけ簡易にする必要がある場合には、この方法が有効である。

【0011】センサローラは、自由に吊り下げられてもよく、例えば、フォイルによって保持される。しかしながら、ガイド手段を設けて、前記少なくとも一つのセンサローラを前記少なくとも一つの転向ローラからの距離が変化している間該ガイド手段に沿って移動させることにより、前記少なくとも一つのセンサローラを正確にガイドして、ずれによる誤動作を避けるのが望ましい。

【0012】特に、前記ガイド手段を略垂直に設置すれば、センサローラがガイド手段の中を摩擦なしにスライドすることが可能になる。前記少なくとも一つのセンサローラは、自重によってフォイル材料の張力を一定に保つことができる。また、必要に応じて、重りを追加することにより、所定の張力に調整してもよい。

【0013】好ましい形態によれば、前記センサ手段は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第1所定距離より小さいときに前記駆動装置を加速させるための信号を出力する、第1センサを有する。別の形態では、前記センサ手段は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が第2所定距離を超えると前記駆動装置を減速させるための信号を出力する、第2センサを有する。このように第1センサ及び第2センサを設ければ、モータ制御を容易に行うことができる。

【0014】また、好ましい別の形態では、本発明に係る装置は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最小許容距離よりも小さいときにエラー信号を発する、第1安全センサを有する。別の形態では、前記センサ手段は、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最大許容距離を超えるとエラー信号を発する、第2安全センサを有する。これらの更なる形態において、誤動作が起きたときや、供給ロールが完全に巻戻されたときには、例えば作業員に警告するための警報信号を発するために、エラー信号が発せられる。

【0015】前記第1、第2センサや安全センサは、例えば、移動するセンサローラによって動かされる機械的なスイッチによって構成されてもよい。一方、特に簡易で信頼性の高い構成のためには、光バリアのような光学センサ素子を設けることが好ましい。このような光学セ

ンサは非接触で作動するためにセンサローラの移動には影響を与えないので、フォイル材料の張力は更に一定に保たれる。

【0016】また、別の実施の形態では、第1、第2センサ又は安全センサとして近接スイッチを設けることにより、簡易で信頼性の高い構造を得るとともに、汚れに強くする。本発明に係る方法の好ましい実施の形態によれば、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最小許容距離よりも小さいとき、前記引き出し手段と供給されたフォイルの更なる加工のための作動部とがスイッチオフされる。これにより、誤動作が起きた場合や、供給ロールが完全に巻戻らない場合には、装置が正常な作動が再び可能になるまでフォイルの供給動作が停止される。また、別の形態によれば、前記少なくとも一つのセンサローラの前記少なくとも一つの転向ローラからの距離が最大許容距離を超えると、前記供給ローラのモータと前記引き出し手段と前記フォイルの更なる加工のための作動部とがスイッチオフされる。最大許容距離が超えられたときには、フォイル材料の送出に明らかに不具合が生じているので、フォイルの更なる供給を停止することに加えて供給ロールのモータをスイッチオフしなければならない。

【0017】本発明に係る方法のこのような形態を実現するため、本発明に係る装置の好ましい形態では、各安全センサから発せられたエラー信号は、少なくとも、前記引き出し手段と前記フォイルの更なる加工のための作動部とをスイッチオフするために用いられる。必要に応じて、引き出し手段は連続的に駆動される。引き出し手段を断続的に駆動する場合でも、本発明の装置及び方法は、このような場合でも引き出し手段の前段のフォイル材料の張力を一定に保つので、本発明の装置及び方法は有効である。

【0018】フォイルを更に加工するために複数のフォイルウェブが必要な場合は、本発明に係る装置を、並列に設けられた複数の供給手段に繰り返し使用することができる。例えば、フォイル材料を供給してフォイルバッグの二つの側部フォイルをそれぞれ形成するために、二つのフォイルウェブが使用され得る。共通の制御ユニットによって、それぞれの供給ロールのモータを個々に作動させることが好ましい。

【0019】

【発明の実施の形態】以下、添付図面に従って本発明に係るフォイル供給装置及び方法の好ましい実施の形態について詳説する。図1及び図2は、本発明に係る装置の第1の実施の形態を示している。符号1は、フォイルの巻戻しが進むにつれて小さくなる直径Dを有する供給ロールである。フォイル15は、供給ロール1から巻き戻され、消費量センサ81に導かれて固定転向ローラ19及び可動センサローラ21に掛けられる。符号67a及び67bは、引き出し手段を模式的に示す。例えば、引

き出し手段は、摩擦グリップによってフォイルに接触し、後に続くフォイル加工動作に応じた速度で駆動される、ローラである。供給ロール1のモータ3及び引き出し手段67a、67bのモータ69の実際の構造はここでは重要でないで、これらのモータは模式的に示す。フォイル材料は、矢印5に示されるように移動する。センサローラ21は、ガイド枠31内に垂直に設けられたガイド手段41a、41bに支持されている。センサローラ21の軸の延長上に、センサローラ21が上下方向に動くとき光バリア43、45、47、49を通過して移動する、トリガ手段39が設けられている。各センサ（光バリア43、45、47、49）は、信号ラインを介して、供給ロール1のモータ3の制御ユニット9に接続されている。矢印35は、センサローラ21の上下運動を示し、矢印7は、供給ロールの回転運動を示す。

【0020】尚、引き出し手段67a、67bの上流側に、フォイルを加工するための要素、例えば、フォイル材料に接合継ぎ目を形成するための接着若しくは接合手段や、穴を形成するための穿孔手段などを更に設けることも可能である。図2aは、本発明に係る装置の第1の実施の形態のある動作状態を示したもので、センサローラ21が、通常運転における最下状態、即ちセンサ47の高さに達している状態を示す。図2bは、センサローラ21がセンサ45とセンサ47との間を上昇している、中間状態を示す。図2cは、センサローラ21が、通常運転における最上点、即ちセンサ45の高さに達している動作状態を示す。

【0021】次に、図1及び図2を参照しながら、本発明に係る装置の第1の実施の形態の作用を説明する。引き出し手段67a、67bは、引き出し手段とフォイルとの間にある摩擦グリップによって、矢印5の方向にフォイル材料15を引っ張る。供給ロール1が静止している状態では、引き出し力によってセンサローラ21がガイド41a、41b内を上昇する。センサローラ21が上側の光学センサの高さに達すると（例えば、図2cに示すように）、トリガ39が光バリア45をトリガする。光バリアが制御ユニット9に信号を送ると、制御ユニット9が供給ロール1のモータ3を起動し、それによって供給ロール1が符号7で示す方向に回転する。これにより、新しいフォイル材料15が供給され、センサローラ21はガイド41a、41b内を下降する。トリガ39がセンサ47に達すると、前記光バリアが起動される。供給ロール1のモータ3をスイッチオフするために制御ユニット9に信号が送られ、その結果、更なるフォイルの供給が停止される（図2a参照）。引き出し手段67a、67bの引き出し動作が継続していると、図2bに示すように、センサローラ21は再び上昇する。センサローラ21が前述のようにセンサ45の高さに達すると、供給ロール1のモータ3が再びスイッチオンされる。

【0022】なお、引き出し手段67a、67bは連続的に又は断続的に駆動される。引き出し手段67a、67bを断続的に作動させた場合は、センサローラ21も断続的に上昇する。供給ロール1が完全に巻き戻された後は、モータ3の作動中であっても、フォイル材料は供給されない。しかしながら、引き出し手段67a、67bは作動し続ける。センサローラ21は上昇する。トリガ39は光バリア45を通過する。しかしながら、フォイル材料は続けて供給されない。その結果、センサローラ21は更に上昇する。そして、センサローラ21が上部安全センサ43（例えば、光バリア）に達すると、エラー信号が発せられ、フォイル供給手段の引き出し手段67a、67bを含む全ての部分がスイッチオフされる。更に、例えば、新しい供給ロール1の挿入が必要であることを作業者に知らせるために、音響信号又は光信号を発することも可能である。もちろん、供給ロールが動かなくなるなどの不具合が起きたためにフォイルの供給が止まった場合にも、安全センサ43が反応する。

【0023】一方、制御ユニット9またはモータ3の誤動作が起きると、センサローラ21及びトリガ39がセンサ47を通過したときに供給ロール1がスイッチオフされない可能性がある。このような場合、センサローラ21は、下部安全センサ49（例えば、光バリア）に達するまで、ガイド41a、41b内を更に下降する。この光バリアは、供給ロール1や引き出し手段67a、67bを含む装置全体を、スイッチオフする信号を送信する。このスイッチオフは、例えば、電源を遮断することによって行われる。更に、音響信号又は光信号を発して、作業者に誤動作が生じたことを知らせることも可能である。また、例えばフォイル材料15がセンサローラ21に達する前に破れた場合も、センサ49が作動する。この場合にも、センサローラ21がセンサ47を通過してセンサ49まで下降し、作業者はエラー信号によって警告される。ガイドレール41a、41bの下端部において、又は、相応に設けられた支柱部材上で、センサローラ21は下降を停止する。

【0024】次に、図3及び図4を参照しながら、本発明に係る装置の別の実施の形態の構造及び作用を説明する。本実施の形態は、引き出し手段68、70の前で合わせられる平行に延びた二つのフォイルウェブを有している。このように二つの平行なフォイルウェブを供給することは、例えばフォイルバッグを製造する際、二つのフォイルを相互に接着するために必要である。このような場合のフォイルは、例えば、ラミネートされたアルミフォイルであってもよい。引き出し手段68、70の上流側、若しくは下流側に、接着手段（図示せず）等を設けてもよい。

【0025】図3において、符号2、4は、それぞれ、直径 D_1 及び D_2 を有し、フォイル材料16、18を供給するための供給ロールを示す。供給ロールは、モータ

6、8によって駆動され、符号7で示す方向に回転する。モータ6、8は、それぞれ信号ライン12、14を介して、制御ユニット10によって制御される。フォイル16、18は、それぞれ消費量センサ80、82に入る。この際、フォイル16、18は、それぞれ固定転向ローラ20、24、及び、可動センサローラ22、26に掛けられる。図3に示す実施の形態では、消費量センサ80、82のそれぞれは、三つの固定転向ローラ20、24と、二つの可動センサローラ22、26から成る。可動センサローラ22、26は、それぞれ連結部材40、42を介して相互に連結しているため、消費量センサ80、82のセンサローラ22、26は、それぞれが同時に上下移動する。矢印36、38は、センサローラ22、26の上下方向の動作を示す。符号44、50は、上側の消費量センサ80の安全センサを示し、符号60、66は、下側の消費量センサ82の安全センサを示す。符号46、48は上側の消費量センサ80のセンサローラ22の上下の転向点におけるセンサを示し、符号62、64は下側の消費量センサ82の対応するセンサを示す。光学センサは、例えば、光バリアとして設計されている。図3上には示されていないが、各光バリアは、信号ラインを介して、供給ロール2、4のモータ6、8を制御する制御ユニット10に接続される。符号28、30は、結合引き出し手段68、70によって引き出される前の各フォイル16、18のための転向ローラを示す。結合引き出し手段68、70は、モータ72によって駆動される。符号32、34は、それぞれ各消費量センサの転向ローラ20、24のための固定マウント手段を示している。

【0026】図4は、消費量センサ80の詳細を示している。消費量センサ82は、消費量センサ80と同一の構造を有する。各フォイルウェブの消費量センサ80、82及びモータ6、8は相互に独立して作動する。図4は、連結部材40が安全センサ44、50を通過したときにエラー信号Fを光学安全センサ44、50から送信するための信号経路52、58を示す。該当する作動部をスイッチオフする光学安全センサの作用形態は、前述した第1の実施の形態の場合と同様である。図4は、更に、図3の供給ロール2のモータ6のスイッチオン又はオフを実行するセンサ46、48の信号経路54、56を示す。第1の実施の形態と同様に、センサローラ22の高さが光学センサ46を通過すると、供給ロール2のモータ6がスイッチオンされ、センサローラ22の高さが光学センサ48を通過すると、供給ロール2のモータ6がスイッチオフされる。固定転向ローラ20とセンサローラ22とがこのように配置され、また、三つの固定転向ローラ20と二つのセンサローラ22とが備えられているために、センサローラ22の位置が安定し、フォイルの誘導精度が向上する。

【0027】第2の実施の形態と同様に、図1及び図2

に示す第1の実施の形態を、複数のフォイルウェブを供給するために、対応する数の消費量センサを設けて、用いることができる。一方、図3及び図4に示すような消費量センサを単独で、単一のフォイルウェブを供給するために用いることもできる。例えば、直立するバッグの側部及び底部のフォイルを形成するために複数のフォイルウェブを供給する場合、そのフォイルウェブの数よりも多い数の消費量センサを設けてもよい。

【0028】以上の説明においては、センサローラと転向ローラとの距離が第1所定距離を超えたときに供給ロールを完全に停止し、センサローラと転向ローラとの距離が第2所定距離よりも小さくなったときに供給ロールを再び駆動する場合の作用について説明したが、本発明はこれに限定されるものではない。例えば、センサローラと転向ローラとの距離が第1所定距離を超えたとき、供給ロールを完全にスイッチオフせずに単に減速させてもよいし、センサローラと転向ローラとの距離が第2所定距離よりも小さくなったときに供給ロールを加速させる態様も可能である。これは、大型で重い供給ロールを使用する際に特に有効である。

【0029】前述したように、第1の実施の形態及び第2の実施の形態では、フォイルの供給動作において、センサローラ21、22の下降はその自重によって開始される。フォイル材料の張力は、センサローラの重さを調節することにより、又は、適宜重りを追加することにより調節することができる。フォイル材料の例として、アルミニウム等の金属の箔、ポリエチレン、ポリスチレン、ポリプロピレン、ポリエチレンテレフタレート等からなるプラスチックシート、及び、プラスチックシート

を積層したものや、プラスチックシートにアルミニウム等の金属をコーティングしたものが挙げられる。

【0030】

【発明の効果】以上説明したように本発明に係るフォイル供給装置及び方法によれば、センサローラがその自重のみ又は適当な追加重りと共にそれぞれのフォイルの上に載せられているので、フォイルに掛かる力は一定し、引き出し手段の前段のフォイルの張力は一定となる。これにより、フォイル材料を精度良く供給することができ、現在のフォイル加工ラインで標準となっている非常に高い動作速度を保つことができる。

【図面の簡単な説明】

【図1】本発明に係る装置の第1の実施の形態の略斜視図

【図2】本発明に係る装置の第1の実施の形態の様々な動作状態を示した図

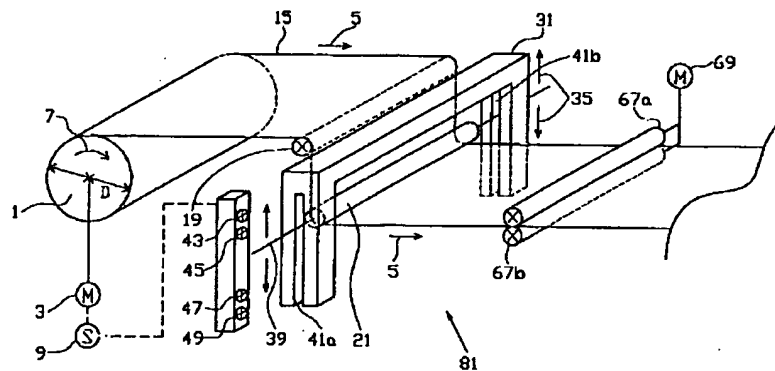
【図3】本発明に係る装置の第2の実施の形態の略側面図

【図4】第2の実施の形態の消費量センサを描いた、図3の詳細を示した図

【符号の説明】

1、2、4…供給ロール、3、6、8…モータ、15、16、18…フォイル材料、19、20、24…転向ローラ、21、22、26…センサローラ、41a、41b…ガイド手段、43、44、49、50、60、66…安全センサ、45、46、47、48、62、64…センサ、67a、67b、68、70…引き出し手段、80、81、82…消費量センサ

【図1】



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